

**Supplementary Table S-F2-3. Summary of Original Research Studies Published Between 2014-2017 on Sedentary Behavior and All-cause Mortality**

Reference	Year of Publication	Population	Sample Size	Age	Definition of Sedentary Behavior	Mortality Follow-up Period	Main Results	Dose-Response
Ding et al. 2015	2015	Australian Adults; 45 and Up Study	231,048	≥45 y	Daily sitting time	2006-09 to 2014  Mean of 6.1 y	HR (95% CI) = 1.33 (1.29-1.38) comparing sitting >7 h/d versus ≤7h/d.	Not tested
Matthews et al. 2015	2015	U.S. Adults; NIH-AARP Diet and Health Study	154,614	59-82 y	Daily sitting time	Mean of 6.8 y	HR (95% CI) across levels of daily sitting time in fully adjusted models: <u>Men:</u> <5 h/d: 1.00 (reference) 5-6.9 h/d: 1.05 (0.98-1.11) 7-8.9 h/d: 1.10 (1.03-1.18) 9-11.9 h/d: 1.19 (1.09-1.29) ≥12 h/d: 1.21 (1.11-1.31) P for trend <0.01 <u>Women:</u> <5 h/d: 1.00 (reference) 5-6.9 h/d: 1.10 (1.01-1.19) 7-8.9 h/d: 1.09 (1.00-1.19) 9-11.9 h/d: 1.25 (1.14-1.38) ≥12 h/d: 1.40 (1.27-1.54) P for trend <0.01  No significant interaction between sitting time and sex on mortality (p = 0.59).	Yes

							In less active participants, replacing sitting time with exercise and non-exercise activities (i.e., household chores) was significantly associated with lower all-cause mortality (with stronger effect of higher intensity exercise). In contrast, only exercise activities and moderate-to-vigorous had significant effects in more active participants.	
Lee et al. 2016	2016	U.S. Women; Women's Health Initiative (WHI)	92,809	50-79 y	Daily Sitting Time	Mean of 10.8 y	HR (95% CI) across quartiles of total daily sitting time in fully adjusted models: ≤5 h/d: 1.00 (reference) 6-9 h/d: 1.05 (0.98-1.13) 10-13 h/d: 1.20 (1.10-1.32) ≥14 h/d: 1.25 (1.07-1.46) P for trend <0.0001	Yes
Pulsford et al. 2015	2015	U.K. Adults; Whitehall II Study	5,132	~ 44 y	Weekly sitting time	1997-99 to 2014  Mean of 15.7 y	HR (95% CI) across levels of weekly sitting time in fully adjusted models: <26 h/wk: 1.00 (reference) 26-<41 h/wk: 1.05 (0.83-1.33) 41-<55 h/wk: 0.72 (0.54-0.98) ≥55 h/wk: 0.92 (0.69-1.22) P for trend = 0.09	No
Warren Andersen et al. 2016	2016	U.S. Adults; Southern Community Cohort Study (SCCS)	79,101	~ 51 y	Daily sitting time	2002-09 to 2011	HR (95% CI) across levels of daily sitting time in fully adjusted models: <5.75 h/d: 1.00 (reference) 5.76-8.5 h/d: 1.07 (1.00-1.14) 8.6-12 h/d: 1.18 (1.11-1.26) >12 h/d: 1.25 (1.16-1.33)	Not tested

							Significant effects were observed in subgroup analyses stratified by sex and race, with the exception of white women.	
Hagger-Johnson et al. 2016	2016	U.K. Women; U.K. Women's Cohort Study	12,778	37-78 y	Daily sitting time	1999-2002 to 2013	Fidgeting modified the association between sitting time and mortality.  HR (95% CI) across categories of sitting time in the low fidgeting groups: <5 h/d: 1.00 (reference) 5-6 h/d: 1.17 (0.95-1.45) ≥7 h/d: 1.30 (1.02-1.66)  There was no increased risk of mortality from longer sitting time in the middle or high fidgeting groups.	Not tested
Martinez-Gomez et al. 2016	2016	Spanish Adults with Disability	2,470	≥60 y	Daily sitting time	2000-01 to 2011  Mean of 8.7 y	HR (95% CI) across categories of sitting time: <4 h/d: 1.00 (reference) 4-6 h/d: 1.27 (1.07-1.51) >6 h/d: 1.55 (1.29-1.87) P for trend <0.001  No significant interaction between sitting time and physical activity (p=0.997).	Yes
Krokstad et al. 2017	2017	Norwegian Adults;	36,911	20-69 y	Daily sitting time	1995-97 to 2010	HR (95% CI) = 1.16 (1.06-1.27) comparing sitting >7 h/d versus ≤7h/d.	Not tested

		Nord-Trondelag Health Study (HUNT)				Mean of 14.1 y		
Grunseit et al. 2017	2017	Norwegian Adults; Nord-Trondelag Health Study (HUNT)	25,651	≥20 y	Daily Sitting Time	Mean of 6.2 y	HUNT2 Cohort (1995-97): HR (95% CI) = 1.02 (0.91-1.16) comparing sitting ≥8 h/d versus <8h/d.  HUNT3 Cohort (2006-08): HR (95% CI) = 1.37 (1.21-1.56) comparing sitting ≥8 h/d versus <8h/d.	Not tested
Stamatakis et al. 2015	2015	Australian Adults; 45 and Up Study	201,129	≥45 y	Daily sitting time; Screen time	2006-09 to 2012  Mean of 4.2 y	HR (95% CI) for replacing 1 hour of sitting time with walking = 0.86 (0.81-0.90).  HR (95% CI) for replacing 1 hour of sitting time with moderate-to-vigorous physical activity = 0.88 (0.85-0.90).  HR (95% CI) for replacing 1 hour of screen time with walking = 0.87 (0.82-0.92).  HR (95% CI) for replacing 1 hour of screen time with moderate-to-vigorous physical activity = 0.89 (0.86-0.91).	Not tested
Shuval et al. 2015	2015	U.S. Adults; Cooper Center Longitudinal Study	3,141	45.0 y	TV viewing time	1982 to 2010  Median of 28.7 y	HR (95% CI) across quartiles of TV viewing time in fully adjusted model: Q1 (0-3 h/d): 1.00 (reference) Q2: (4-7 h/d): 0.93 (0.73-1.19)	No

							Q3: (8-12 h/d): 1.13 (0.90-1.43) Q4 (≥13 h/d): 0.99 (0.77-1.27) P for trend = 0.671	
Kozey Keadle et al. 2015	2015	U.S. Adults; NIH-AARP Diet and Health study	165,087	50-71 y	TV viewing time	1994-1996 & 2004-2006 to 2011  Mean of 6.6 y	HR (95% CI) across levels of TV viewing time in fully adjusted model in 1996-97 cohort: <3 h/d: 1.00 (reference) 3-4 h/d: 1.04 (1.01-1.08) ≥5 h/d: 1.11 (1.06-1.15) P for trend <0.001  HR (95% CI) across levels of TV viewing time in fully adjusted model in 2004-05 cohort: <3 h/d: 1.00 (reference) 3-4 h/d: 1.11 (1.08-1.15) ≥5 h/d: 1.29 (1.25-1.34) P for trend <0.001	Yes
Wijndaele et al. 2017	2017	U.K. Adults; U.K. Biobank	423,659	40-69 y	Leisure Screen Time	2006-2010 to 2016  Median of 7.6 y	HR (95% CI) for replacing 30 min of screen time with daily-life activities = 0.95 (0.94-0.97).  HR (95% CI) for replacing 30 min of screen time with structured exercise = 0.87 (0.84-0.90).	Not tested
van der Ploeg et al. 2015	2015	Danish Adults; Danish Work Environment Cohort Study (DWECS)	NA	≥21 y	Occupational Sitting Time	1991 to 2010  Mean of 12.6 y	HR (95% CI) for comparing ≥24 h/wk versus <24 h/wk = 0.97 (0.79-1.18).	Not tested

Kikuchi et al. 2015	2015	Japanese Adults	36,516	50-74 y	Occupational Sitting Time	2000-03 to 2011  Mean of 10.1 y	Among primary industry workers, HR (95% CI) for occupational sitting:  <u>Men:</u> < 1 h/day: 1.00 (reference) 1-<3 h/d: 1.16 (0.94-1.43) ≥3 h/d: 1.23 (1.00-1.51)  <u>Women:</u> < 1 h/day: 1.00 (reference) 1-<3 h/d: 1.01 (0.73-1.42) ≥3 h/d: 1.34 (0.97-1.84)  No associations were found among secondary or tertiary workers.	Not tested
Schmid et al. 2015	2015	U.S. Adults; 2003-04 National Health and Nutrition Examination Survey (NHANES)	1,677	≥50 y	Waist Accelerometry (<100 counts/min)	2003-04 to 2006  Mean of 2.9 y	RR (95% CI) for greater sedentary time (≥ median of 8.6 h/day) = 2.03 (1.09-3.81).  No significant interaction between sedentary time and moderate-to-vigorous physical activity (p=0.51).	Not tested
Schmid et al. 2016	2016	U.S. Adults; 2003-04 & 2005- 06 National Health and Nutrition Examination Survey (NHANES)	3,702	50-85 y	Waist Accelerometry (<100 counts/min)	2003-04 to 2011  Mean of 6.4 y	HR (95% CI) across tertiles of sedentary time in fully adjusted model: Q1: 1.00 (reference) Q2: 1.04 (0.36-2.99) Q3: 1.43 (0.71-2.88) P for trend = 0.83	No

							<p>HR (95% CI) for replacing 30 min/d of sedentary time with light activity = 0.88 (0.84-0.92).</p> <p>HR (95% CI) for replacing 30 min/d of sedentary time with moderate-to-vigorous activity = 0.51 (0.32-0.83).</p> <p>Significant results were observed in sedentary time substitution subgroup analyses stratified by age, sex, and waist circumference.</p>	
Fishman et al. 2016	2016	U.S. Adults; 2003-04 & 2005-06 National Health and Nutrition Examination Survey (NHANES)	3,029	50-79 y	Waist Accelerometry (<100 counts/min)	2003-04 to 2011  Mean of 6.5 y	<p>HR (95% CI) for replacing 30 min of sedentary time with light activity = 0.80 (0.75-0.85).</p> <p>HR (95% CI) for replacing 30 min of sedentary time with moderate-to-vigorous activity = 0.49 (0.25-0.97).</p>	Not tested
Matthews et al. 2016	2016	U.S. Adults; 2003-04 & 2005-06 National Health and Nutrition Examination Survey (NHANES)	4,840	≥40 y	Waist Accelerometry (<100 counts/min)	2003-04 to 2011  Mean of 6.6 y	<p>HR (95% CI) for more-sedentary time (10 h/day) compared with less-sedentary time (6 h/day) = 1.29 (1.1-1.5).</p> <p>HR (95% CI) for replacing 1 h of sedentary time with light activity = 0.82 (0.73-0.92)</p> <p>HR (95% CI) for replacing 1 h of sedentary time with moderate-</p>	Yes

							to-vigorous activity = 0.58 (0.44-0.77)  Significant interaction between sedentary time and total activity level (p<0.01). No mortality benefit for replacement of sedentary time with physical activity in highly active adults.	
Loprinzi et al. 2016	2016	U.S. Adults; 2003-04 & 2005-06 National Health and Nutrition Examination Survey (NHANES)	5,575	20-85 y	Waist Accelerometry (<100 counts/min)	2003-04 to 2011  Median of 6.8 y	HR (95% CI) per 1 min of sedentary time = 1.001 (1.0003-1.002).  No association between sedentary time and mortality in active adults but a significant association among inactive adults.	Yes
Loprinzi and Joyner 2016	2016	U.S. Adults; 2003-04 & 2005-06 National Health and Nutrition Examination Survey (NHANES)	5,278	20-85 y	Waist Accelerometry (<100 counts/min)	2003-04 to 2011  Median of 6.8 y	When stratified by visual acuity group (normal vision; uncorrected refraction error; visual impairment) there were no associations between sedentary time and all-cause mortality.  *small sample sizes in stratified groups	Not tested
Lee 2016	2016	U.S. Adults; 2003-04 & 2005-06 National Health and Nutrition Examination Survey (NHANES)	7,006	≥18 y	Waist Accelerometry (<100 counts/min)	2003-04 to 2011  Mean of 6.7 y	HR (95% CI) per 1 h of sedentary time = 1.15 (1.01-1.31) among participants who spend ≥ 10.9 h per day in sedentary behavior.  Associations of moderate physical activity and sedentary behaviors on all-cause mortality were independent of each other.	Yes

Evenson et al. 2016	2016	U.S. Adults; 2003-04 & 2005-06 National Health and Nutrition Examination Survey (NHANES)	3,809	≥40 y	Waist Accelerometry (<100 counts/min)  Self-reported screen time	2003-04 to 2011  Mean of 6.7 y	HR (95% CI) across quartiles of sedentary time (min): Q1 (≤ 413.4): 1.00 (reference) Q2 (413.5-497.6):1.05 (0.71-1.55) Q3 (497.7-588.3): 0.86 (0.58-1.27) Q4 (≥588.4): 0.97 (0.65-1.44) P for trend = 0.64  HR (95% CI) across tertiles of self-reported screen time (h/day): T1 (≤ 2.0): 1.00 (reference) T2 (2.1-3.5) 0.77 (0.57-1.04) T3 (≥3.6): 1.01 (0.78-1.31) P for trend = 0.15	No
Evenson et al. 2017	2017	U.S. Adults; 2003-04 & 2005-06 National Health and Nutrition Examination Survey (NHANES)	4,510	≥40 y	Waist Accelerometry (<100 counts/min)  Sedentary bouts defined as ≥ 30 min with ≥80% of the minutes <100 counts/min, allowing for < 5 min above the threshold.	2003-04 to 2011  Mean of 6.6 y	Latent-class analysis of accelerometry data revealed no significant associations between percentage of the day in sedentary behavior and all-cause mortality.  HR (95% CI) comparing the class with the highest percentage of the day in sedentary bouts to the class with fewer sedentary bouts = 2.10 (1.11-3.97).	Not tested
Edwards and Loprinzi 2016	2016	U.S. Adults; 2003-04 & 2005-06 National Health and Nutrition	2,955	20-85 y	Waist Accelerometry (<100 counts/min)	2003-04 to 2011  Median of 6.8 y	HR (95% CI) comparing below-median to above-median sedentary behavior = 0.59 (0.34-1.04); P=0.07.	Not tested

		Examination Survey (NHANES)						
Koolhaas et al. 2017	2017	Adults from The Netherlands; The Rotterdam Study	1,839	45-98 y	Wrist Accelerometry (<199 counts/min)	2004-07 to 2015  Median of 7.5 y	HR (95% CI) per 1 h of sedentary time = 1.04 (0.96-1.13).  In subgroup analyses stratified by sex, the association was only significant in men.	Men: Yes  Women: No
Ensrud et al. 2014	2014	U.S. Men; Osteoporotic Fractures in Men (MrOS) Study	2,918	≥71 y	SenseWear Pro Armband Activity Monitor (awake sedentary time)	Mean of 4.5 y	HR (95% CI) across quartiles of sedentary time: <772 min/d: 1.00 (reference) 772-844 min/d: 1.26 (0.92-1.75) 845-914 min/d: 1.12 (0.81-1.56) ≥915 min/d: 1.56 (1.15-2.14) P for trend = 0.01  No significant age interaction was observed.  Significant interaction between sedentary time and physical activity (p=0.005). Significant association between sedentary time and mortality only in men above the median for time spent in at least moderate-intensity physical activity.	Yes

Legend: CI=confidence interval, HR=hazard ratio, NA=not available, TV=television.

Note: This table does not include original articles identified in the systematic reviews and meta-analyses.

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